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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,782	06/11/2003	Paul Silinger	H0002233 US - 4018/H9925-	2472
63993	7590	10/27/2008	EXAMINER	
BUCHALTER NEMER 18400 VON KARMAN AVE. SUITE 800 IRVINE, CA 92612			VAN, LUAN V	
			ART UNIT	PAPER NUMBER
			1795	
			MAIL DATE	DELIVERY MODE
			10/27/2008	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/765,782

**Applicant(s)**

SILINGER ET AL.

**Examiner**

LUAN V. VAN

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

Applicant's amendment of August 7, 2008 does not render the application allowable. Claims 1-14 are pending in the application.

***Status of Objections and Rejections***

All rejections from the previous office action are maintained.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over The Admitted Prior Art (figure 1 of the applicant's specification) in view of Akino et al. (JP pub 08-296086).

Regarding claim 1, The Admitted Prior Art teaches a plating system comprising: an elongated upper channel and an elongated lower channel (shown in Prior Art Fig. 1 of the disclosure); and a plating solution sparger 11 in Fig. 1 comprising a series of inlets oriented to direct any plating solution flowing through the inlets into one and towards another of the upper and lower channels.

The Admitted Prior Art differs from the instant claims in that the reference does not explicitly teach the horizontal sparger of the instant claim.

Akino et al. teach a hydraulic nozzle 7 (i.e., horizontal sparger, figure 1) to permit the flow of electrolyte towards the cathode in a plane substantially coplanar with the cathode. Plating thickness uniformity is attained in this configuration (paragraph 14).

Since the plating electrolyte is introduced by the hydraulic nozzle of Akino et al. directly into the lower channel, the plating electrolyte is displaced from the lower channel to the upper channel as the plating electrolyte is continuously introduced into the plating tank. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of The Admitted Prior Art by using the horizontal sparger of Akino et al., because it would permit the substrate to receive fresh electrolyte, thus improving the plating thickness uniformity. Furthermore, since Akino et al. teach that a configuration having a nozzle inlet to direct fluid into the lower channel would plate a substrate having a uniform plating thickness, it would have been obvious to one having ordinary skill in the art to have modified the sparger of The Admitted Prior Art with the nozzle inlet of Akino et al. in order to electroplate a substrate having a uniform plating thickness.

Regarding claim 2, The Admitted Prior Art teaches the system of further comprising: an anode 14; and a substantially planar cathode 90 comprising a first conductive surface, a second conductive surface, and a perimeter edge, the first conductive surface and second conductive surface being substantially parallel to each other and positioned on opposite sides of the cathode; wherein the sparger 11 is positioned at least as close to the perimeter edge of the cathode as to either of the first or second conducting surface (see Fig. 1).

Regarding claim 3, the system from the combination of The Admitted Prior Art and Akino et al. would enable the sparger to direct the plating solution towards the cathode in a plane substantially coplanar with the cathode.

Regarding claim 4, The Admitted Prior Art teaches each of the upper and lower channels comprises two substantially planar and parallel non-electrically conductive sides (page 1, lines 17-18, applicant's disclosure) that are substantially parallel to the cathode; and the cathode is positioned at least partially within each of the upper and lower channels between the non electrically conductive sides (see Fig. 1).

Regarding claim 5, The Admitted Prior Art teaches the upper and lower channels are positioned opposite each other and are separated from each other, the separation between the channels forming a pair of solution egress slots (see Fig. 1); and the channels are adapted to prevent current from flow between the anode and cathode other than through the egress slots (see Fig. 1).

Regarding claim 6, The Admitted Prior Art teaches the egress slots are positioned approximately parallel to a center line of the cathode (see Fig. 1).

Regarding claim 7, the apparatus of The Admitted Prior Art is structurally capable of plating a cathode comprising a dielectric substrate and conductive surfaces.

Regarding claims 8, 10, 11 and 14, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have recognized that the distance between the shield and the cathode affects the degree in which the electric field lines, extending from the anode to the cathode, reach the edge of the cathode or substrate. It is understood to one having ordinary skill in the art that charge buildup

tends to occur at edges of the cathode substrate, causing a greater concentration of material deposition to occur in these areas and thus resulting in nonuniformity of the electroplated metal on the substrate. It would have been obvious to one having ordinary skill to have modified the distance between the shield and the cathode of The Admitted Prior Art through routine experimentation in order to prevent charge buildup at the cathode substrate edges and thus reducing nonuniformity in the electroplated metal. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have reduced the distance between the shield and the cathode of The Admitted Prior Art, because electroplating apparatus can be made to occupy less space.

Regarding claim 13, The Admitted Prior Art teaches the upper channel and lower channel are separated by a distance. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of The Admitted Prior Art by varying the distance, because it would allow substrates of different sizes to be uniformly electroplated.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akino et al. in view of The Admitted Prior Art.

Regarding claim 1, Akino et al. teach plating system comprising: an elongated upper channel formed by a plurality of upper shields 4 (figure 1) and an elongated lower channel formed by a plurality of lower shields 5, wherein each channel is separated by a gap between the upper and lower shields; and the plating solution horizontal sparger 7

oriented to direct any plating solution flowing through the inlet directly into one and towards another of the upper and lower channels.

Akino et al. differ from the instant claims in that the reference teaches a single inlet but does not explicitly teach whether there is a series of them.

The Admitted Prior Art teaches a series of inlets to permit a plating solution to flow into the vertical spargers (figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Akino et al. by using the series of inlets of The Admitted Prior Art, because the additional inlets would distribute the plating solution along the length of the substrate to permit the whole substrate to receive fresh electrolyte, thus enabling a uniform plating thickness.

Regarding claim 2, Akino et al. teach the system of further comprising: an anode 2; and a substantially planar cathode 3 comprising a first conductive surface, a second conductive surface, and a perimeter edge, the first conductive surface and second conductive surface being substantially parallel to each other and positioned on opposite sides of the cathode; wherein the sparger 7 is positioned at least as close to the perimeter edge of the cathode as to either of the first or second conducting surface (see Fig. 1).

Regarding claim 3, the sparger of Akino et al. directs the plating solution towards the cathode in a plane substantially coplanar with the cathode.

Regarding claim 4, Akino et al. teach each of the upper and lower channels comprises two substantially planar and parallel non-electrically conductive sides that are

substantially parallel to the cathode; and the cathode is positioned at least partially within each of the upper and lower channels between the non electrically conductive sides (see Fig. 1).

Regarding claim 5, Akino et al. teach the upper and lower channels are positioned opposite each other and are separated from each other, the separation between the channels forming a pair of solution egress slots (see Fig. 1); and the channels are adapted to prevent current from flow between the anode and cathode other than through the egress slots (see Fig. 1).

Regarding claim 6, Akino et al. teaches the egress slots are positioned approximately parallel to a center line of the cathode (see Fig. 1).

Regarding claim 7, the apparatus of Akino et al. is structurally capable of plating a cathode comprising a dielectric substrate and conductive surfaces.

Regarding claims 8, 10, 11 and 14, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have recognized that the distance between the shield and the cathode affects the degree in which the electric field lines, extending from the anode to the cathode, reach the edge of the cathode or substrate. It is understood to one having ordinary skill in the art that charge buildup tends to occur at edges of the cathode substrate, causing a greater concentration of material deposition to occur in these areas and thus resulting in nonuniformity of the electroplated metal on the substrate. It would have been obvious to one having ordinary skill to have modified the distance between the shield and the cathode of Akino et al. through routine experimentation in order to prevent charge buildup at the cathode



substrate edges and thus reducing nonuniformity in the electroplated metal.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have reduced the distance between the shield and the cathode of Akino et al., because electroplating apparatus can be made to occupy less space.

Regarding claim 13, Akino et al. teach the upper channel and lower channel are separated by a distance. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Akino et al. by varying the distance, because it would allow substrates of different sizes to be uniformly electroplated.

### ***Response to Arguments***

Applicant's arguments filed have been fully considered but they are not persuasive. In the arguments presented on page 7 of the amendment, the applicant argues that air is used as the fluid in the nozzle of Akino and therefore does not read on claim 1 which recites directing a plating solution through the inlets. While the examiner agrees that Akino teaches that air is an exemplary fluid that could be used in the hydraulic nozzle 7, the disclosure of Akino is not limited only to air or gas phase fluids. The nozzle of Akino is structurally capable of being used with a plating solution. Furthermore, as the applicant is aware, since the instant claims are directed to an apparatus, "[e]xpressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, "[i]nclusion of

material or article worked upon by a structure being claimed does not impart patentability to the claims." *In re Young*, 75 F.2d 996, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)). The examiner believes that he has met the requirement for a prima facie case of obviousness, and therefore all rejections are maintained.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan V. Van whose telephone number is 571-272-8521. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Nam X Nguyen/  
Supervisory Patent Examiner, Art Unit 1753

LVV  
October 20, 2008